

# ENDF-6 Format Manual Status

*D. Brown, National Nuclear Data Center, BNL*



U.S. DEPARTMENT OF  
**ENERGY**

Office of  
Science

# Where to find the in-dev manual

[www.nndc.bnl.gov](http://www.nndc.bnl.gov)

Reactions tab

The link

The screenshot shows the NNDC website interface. A red arrow points to the URL [www.nndc.bnl.gov](http://www.nndc.bnl.gov). Another red arrow points to the 'Reactions' tab in the navigation bar. A third red arrow points to the 'In-development ENDF-6 Format Manual' link in the 'Evaluated ENDF data' section.

Navigation bar: BNL, Projects, News, Python, Reference, Institutions, Share, Fun, GForge, ENDF Manual, endf-manual-latest...

Header: NNDC National Nuclear Data Center, BROOKHAVEN NATIONAL LABORATORY, Site Index

Chart of Nuclides: NSR, XUNDL, ENSDF, NuDat, Databases, MIRD, CSISRS, ENDF, Chart of Nuclides, Empire, Atlas of n Resonances, Nuclear Wallet Cards, Tools and Publications, Networks, CSEWG, USNDP, Nuclear Data Sheets

Mini-CSEWG 2017: Integrated Digital Conference, Mini-CSWEG, May 4 - May 5, 2017 at Los Alamos National Lab.

ENDF/B-VIII beta4 Release

Nuclear Data Sheets Announcement

Nuclear Data Sheets Special Issue

Reactions tab: Experimental data, Codes, Evaluated ENDF data, Other evaluated data, Tools

Experimental data: EXFOR Experimental nuclear reaction data, The EXFOR project, EXFOR Basics Short guide

Codes: Checking & utility codes, Reaction codes, EMPIRE Nuclear Reaction Model Code

Evaluated ENDF data: ENDF/B-VII.1 Current ENDF release, ENDF/B-VIII.0 In-development ENDF library, The ENDF project, Sigma ENDF Retrieval & Plotting, Current ENDF-6 Format Manual, In-development ENDF-6 Format Manual, Introduction to ENDF Formats, ADVANCE ENDF continuous integration system

Other evaluated data: Atlas of Neutron Resonances Parameters & thermal values, Atomic Mass Evaluation, IRDF International Reactor Dosimetry File, Monitor Reactions IAEA recommended charged-particle cross sections, RIPL-3 Reference Input Parameter Library

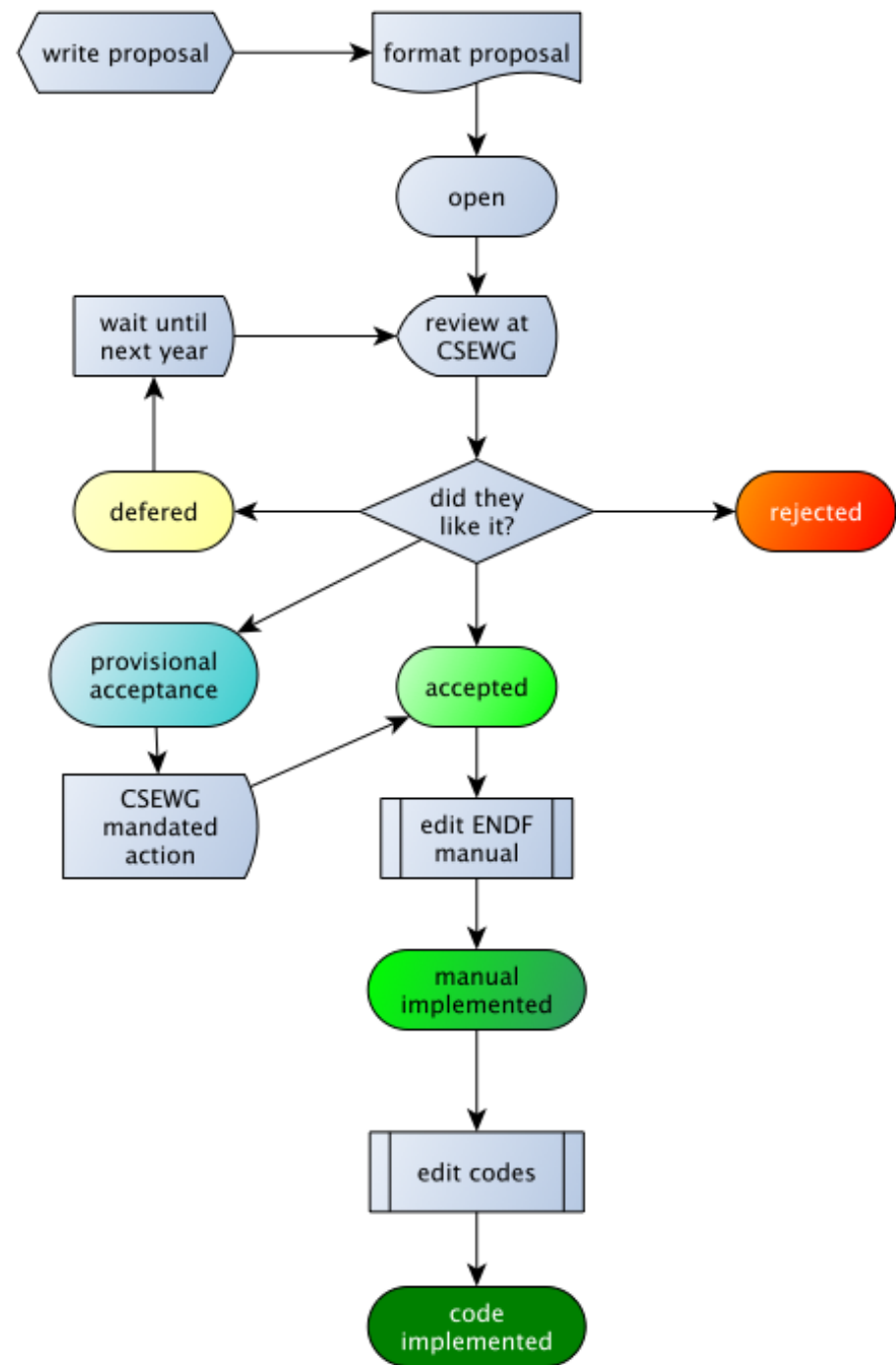
Tools: CapGam Thermal neutron capture  $\gamma$ -rays, Gamma Ray Atlas Following Inelastic Scattering of Fast Neutrons Downloadable software platform, EXFOR/ENDF Plotting, NucRates MACS and astrophysical reaction rates, MyENDF Integrated web tool for evaluators, Q-value Calculator, USNDP/CSEWG GForge Collaboration server

# Big things are coming

- Revised manual must be released with ENDF/B-VIII. This is the last chance to modify the format before the release.
- Both ENDF-6 manual and GND specifications due with ENDF/B-VIII.

# Life cycle of a format change (as understood by GForge)

- Now is on main manual GForge page



# Format changes

ID	Summary
945 ✓	Update tables of physical constants in Appendix H
982 ✓	Reword the INT=6 charged particle interpolation rule
983 ✓	Clearly define legal characters in an ENDF TEXT field
984 ✓	Clearly define legal numbers in ENDF format
997	Allow MF=4/5 for incident gamma evaluations
1008 ✓	'LCT' option for specifying product frames in MF 6
1033 ✓	Clarify the allowed floating point number formats
1034 ✓	ZAID for TSL evaluations
1035 ✓	Revise MAT number assignments in light of new evaluations
1045 ✓	Use atomic masses rather than nuclear masses to compute Q values
1061	format change in MF6/MT18 to accommodate P(Mg) and multiplicity-dependent PFGS.

# Typos

ID	Summary
✓ 950	Incoherent scattering in chapter 27
✓ 1000	Equation reference for scattering radius in File 2
✓ 006	Allowed float format not specific/clear enough

# Improvements

ID	Summary
834	Add MLBW angular distribution discussion
939	"Codes and Formats Subcommittee Leadership" list needs updating
941 ✓	Clarify kinematics discussion in appendix E
942	Need new preface for upcoming format manual release to go with new ENDF release
985 ✓	Explain the 80 column punchcard format and the ENDF manual notation describing how to populate it
1052 ✓	Legendre moment coefficient definitions differ between Chap. 4 and Appendix B
1062	Clarify differential cross section notation

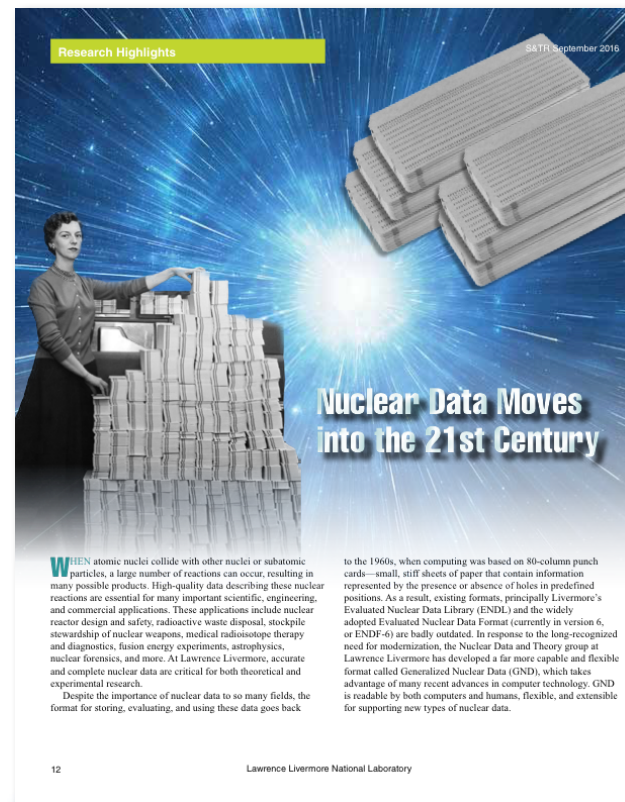
# So what's left before ENDF/B-VIII?

- Preface
- “Changelog” appendix
- Codes and formats committee leadership
- The two format changes
- Proofreading



# What about the manual for GND?

- **“New management”**
  - LLNL & BNL active participants in WPEC SG-38, format development
  - BNL to chair SG-B, format governance
  - LLNL/LANL to chair SG-43, API development
- **De-facto reference implementation:**
  - FUDGE-4.2.1 Released Mar. 2016
  - GND-1.7 Released Mar. 2016
- **Documentation:**
  - Requirements BNL report BNL-112394-2016-IR
  - Complete format specifications due FY17
- **ENDF/B-VIII to be released in both ENDF/B-6 and GND formats**



GND Highlighted in LLNL's  
Sep. 2016 issue of Science &  
Technology Review